

BLDC MOTOR NOISE REDUCTION USING CONSTANT BUS CURRENT CONTROL COMMUTATION

ABSTRACT OF THE DISCLOSURE

A motor control system creates a rounding effect on square wave phase currents which results in reduced acoustic noise. The control system includes a voltage source for providing a DC bus current, and an inverter. The inverter has a switching circuit for regulating the DC bus current to a fixed level. The switching circuit also forces consecutive phases of the motor to share the bus current at commutation. Forcing consecutive phases of the motor to share a desired amount of the DC bus current creates a "rounding" effect on the phase currents, which results in reduced acoustic noise. The preferred inverter has a plurality of transistors, and a control module. The control module selectively engages the transistors such that each phase of the motor has a phase turn-on point that occurs before a phase turn-off point of a preceding phase. The control module also pulse width modulates the transistors such that the DC bus current is regulated to the fixed level. The result is a motor control system and method that is less expensive and produces less acoustic noise than conventional noise.